

Chico

"Dedicated to Public Service"

THE RADIATOR

W6RHC
IRLP #8170

www.gearsw6rhc.org

P.O.Box 202 Chico, CA 95927

June 2019 Newsletter

GEARS Founded August 13, 1939

News

It's June and that means Field Day. Sat & Sun June 22-23, come by and setup early if you'd like. We will be back at the Masonic Lodge 1110 W East Ave, Chico. Should be another fun one. GARS will be joining us this year. Invite friends to join us.

The May GEARS auction was a good long one this year. Gross was about \$4,200 or about \$600 more than last year. We offered a discount to Camp Fire survivors and the proceeds went to the Weir & Post estates, GEARS and GARS.

Our own Michael Ellithorp, KF6OBI has been appointed as District 2 Emergency Coordinator of Sacramento Valley Section ARES.

The GEARS/GARS new repeater project is proceeding along. We are waiting for approval from the US Forest Service before we can begin installation.

At our next GEARS meeting Kevin Fullerton WB7SKS will be talking about emergency operations for the Camp Fire. He has some very interesting experiences to tell us about, and suggestions for preparing for emergencies.

The Steak Bake is Sep.7th at Wildwood picnic area in Chico at 3:30pm - 7pm.

This month our feature article is about Edwin Armstrong, inventor of FM radio, and the superheterodyne receiver. We use his technology every day.



'73

Jim Matthews K6EST
jiminchico@yahoo.com
 530-893-3314



Join GEARS on Facebook
www.facebook.com For timely
 news and additional information.

June 2019 Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
						1
2 2pm VEC Testing 8pm OARS Net	3 7pm GARS Net 8pm ARES Net	4 7:30pm GEARS Net	5	6 7pm Simplex Net	7	8 9am Chico Breakfast
9 8pm OARS Net	10 7pm GARS Net 8pm ARES Net	11 7:30pm GEARS Net	12	13 6:30 GARS Meeting 7pm Simplex Net	14 7pm OARS Meeting	15
16 8pm OARS Net	17 7pm GARS Net 8pm ARES Net	18 7:30pm GEARS Net 7pm ARES Meeting	19	20 7pm Simplex Net	21 7pm GEARS Meeting	22 Field Day
23 Field Day 8pm OARS Net	24 7pm GARS Net 8pm ARES Net	25 7:30pm GEARS Net	26	27 7pm Simplex Net	28	29 9am OARS Breakfast
30 8pm OARS Net						

VEC Testing, FCC License Exam First Sunday of every even numbered month, at the Butte County Search and Rescue Building. Written test at 2:00 pm. For information or registration call Tom Rider, W6JS 514-9211

Chico Breakfast 2nd Saturday of each month 9am Farmers Skillet 1818, 690 Rio Lindo Ave, Chico

OARS Meeting Second Friday, of month, 7:00 pm, at St. Paul's Church Parish Hall, 1430 Pine St., Oroville

GARS Meeting Second Thursday of month, 6:30 pm Lutheran Church Hall, 565 Main St. Artois.

Butte ARES Meeting 3rd Tuesday, Except Nov & Dec. at Chico Veterans Hall 7pm. Contact Dale Anderson, KK6EVX 826-3461 for more information.

GEARS Meeting, third Friday of month, Butte County Search and Rescue Bldg., Chico. Social hour 6:00 pm, meeting at 7:00 pm. Board meeting 5pm (summer only)

OARS Breakfast 4th Saturday of the month 9am Gold Country Casino & Hotel, 4020 Olive Hwy, Oroville

NETS:

OARS Club Net Sunday 8pm 146.655 Mhz - PL 136.5

GARS Club Net: Monday, 7:00 pm 147.105 MHz + PL 110.09

Butte ARES Net Mondays 8pm 145.290 MHz - PL 110.9

Yuba Sutter Club Net Monday 7pm 146.085 MHz + PL 127.3

GEARS. Club Net Tuesdays 7:30 PM 146.850 MHz - PL 110.9

Simplex Net Thursday 7:30 p.m. 146.52 no tone

Yuba Sutter ARES Net Thursdays 7pm 146.085 MHz + PL 127.3

Sacramento Valley Traffic Net Nightly 9:00 PM 146.850 MHz - PL 110.9

Field Day

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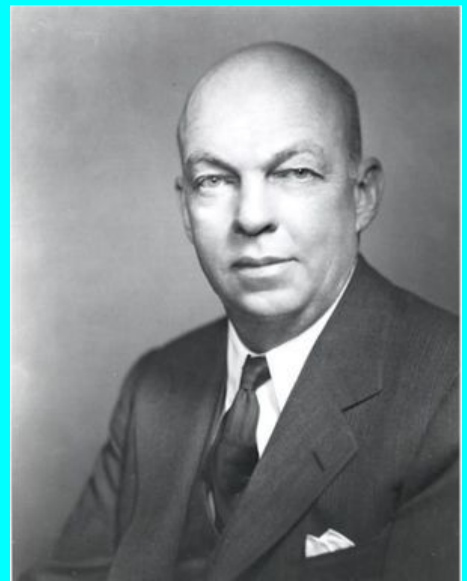
GEARS Auction



The Tragic Birth of FM Radio

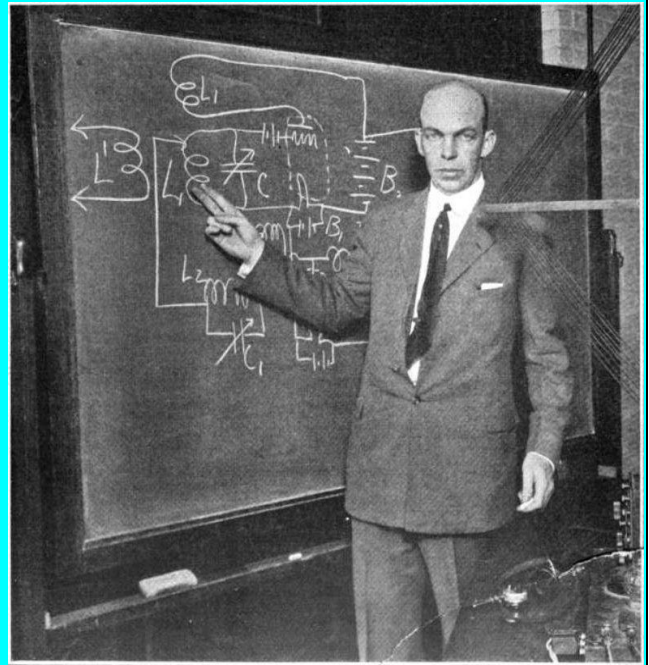
By Greg Bjerg

In 1934, much of the world was in the grip of the Great Depression. Unemployment was an epidemic, and many businesses struggled desperately to survive. One notable exception to these economic troubles, however, was the radio industry. Broadcasters in the US were making upwards of two billion dollars a year, and they owed much of their success to the innovations of a brilliant man named Edwin Armstrong. Twenty years earlier he had significantly improved the sensitivity and quality of radio receivers with his invention of the regenerative circuit in his junior year of college, and he went on to further improve them with his Super Regenerative circuit and Super Heterodyne receiver. These laid the foundation for the success of radio broadcasting— in fact, almost any radio you buy today will still incorporate these innovations. But in 1933, Armstrong brought about an even more revolutionary change in the broadcasting business: FM radio.



In spite of these brilliant technical achievements, Armstrong saw little financial benefit from his inventions. Many of his ideas were plundered by unscrupulous people, a trend which ultimately led to Armstrong's tragic and premature death.

The first of Armstrong's technology troubles began in 1922 when he lost a patent lawsuit for the rights to the regenerative circuit. A man named Lee De Forest had patented the same invention in 1916— two years after Armstrong's patent was granted— and sold the rights to AT&T. A long and bitter legal dispute followed, which progressed all the way to the US Supreme Court. Utterly failing to grasp the technical facts in question, the Supreme Court ruled in favor of De Forest, and stripped Armstrong of his patent. Despite the scientific community's certainty that Armstrong was the inventor of the regenerative circuit, Armstrong lost the patent battle which spanned twenty-one years, thirteen court rulings, and thirty judges.



In the meantime, between court appearances and legal meetings, Armstrong continued to innovate. He started to work on the "static problem" which plagued early radios, despite some colleague's assertion that static could never be eliminated. At the time, radio was transmitted via Amplitude Modulation (AM), which varied the amplitude of the radio waves. This gave the signal a much wider reach, but resulted in poor-quality sound. Armstrong sought to improve the signal quality by instead varying the radio waves' frequency, creating Frequency Modulation radio (FM). He won a patent for FM radio in 1933, and the following year he did his first field test when he broadcast an organ recital in AM and FM signals from the top of the Empire State Building. The AM broadcast was static-filled and the FM broadcast was clean and rich. Listeners were shocked by the difference. Later, in experiment after experiment he proved the on-air differences and improvements in sound.

Just before World War II, Armstrong successfully lobbied the FCC to create an FM broadcast spectrum between 42 and 50 MHz. He built an experimental station and 410-foot tower at a cost of \$300,000 in Alpine, New Jersey. He started a small network of high-powered FM stations in New England called the Yankee Network, and began manufacturing receivers to pick up the broadcasts. To all who heard the fledgling network, its quality was astounding. The broadcasts could deliver the entire range of human hearing between 50 and 15,000 cycles while AM delivered only 5,000 cycles. A club for FM radio enthusiasts started in pre-war New York, and launched its own magazine called FM. Armstrong was trying as hard as he could to prove the superiority of FM broadcasts... all people had to do was listen.

Armstrong went on to prove that FM was capable of dual-channel transmissions, allowing for stereo sound. This capability of FM could also be used to send two separate non-stereo programs, or a facsimile and telegraph message simultaneously in a process called multiplexing. He even successfully bounced a FM signal off the moon, something not possible with AM signals.

Of course AM radio was big business in the pre-television days, and there were powerful people who wanted things to stay as they were. Innovation only meant smaller profits for them. At that time there was no more influential man in radio media than the founder of RCA, David Sarnoff. Known as "The General," Sarnoff controlled all the technical aspects of radio; he also created the NBC and ABC television networks. He was also an important early supporter of television and developed the current NTSC standard for TV that we have used for over 60 years.

Seeking to kill FM radio before it could threaten his profits, Sarnoff's company successfully lobbied the FCC to

have the FM spectrum moved from Armstrong's frequencies to the ones we use today: 88 to 108 MHz. That move, which occurred on June 27, 1945, immediately rendered Armstrong's Yankee Network obsolete, along with all of the FM radio sets which had been produced. The cost to re-equip the stations for the new frequencies would be enormous. The FCC ruling said that the 40 MHz band was to be used for the new television broadcasts, in which RCA had a heavy stake. RCA also had an ally in AT&T, which actively supported the frequency move because the loss of FM relaying stations forced the Yankee Network stations to buy wired links from AT&T. The deck was stacked against the future of FM broadcasting.

Matters became worse when Armstrong became entangled in a new patent suit with RCA and NBC, who were using FM technology without paying royalties. The cost of the new legal battle compounded the financial burden that the problems with the Yankee Network had caused. His health and temperament deteriorated as the FM lawsuit dominated his life. His wife of thirty-one years, unable to cope with his worsening personality and financial strain, left him in November of 1953. RCA's greater financial resources crushed Armstrong's legal defences, and he was left penniless, alone, and distraught.

On February 1, 1954, Armstrong's body was discovered on the roof of a three-story wing of his apartment building. In despair, he had thrown himself out the window of his thirteenth-floor New York City apartment sometime during the night. He died believing he was a failure, and that FM radio would never become accepted. Through the years Armstrong's widow would bring twenty-one patent infringement suits against many companies, including RCA. She eventually won a little over \$10 million in damages. But it would take further decades for FM radio to reach its potential.

Following Armstrong's death, television's emerging popularity ended radio's golden years. Slowly, listeners learned that FM radio was clearly better for musical high fidelity than AM broadcasts. Radios started to have an FM band included with the AM band in the late 1950s and 1960s. By the 1970s, FM audience size surpassed that of AM, and the gap has been growing ever since. Today over 2,000 FM stations broadcast in the United States, and FM signals are commonly used for microwave relay links and space communications. Edwin Armstrong's innovations clearly changed the world; had he not taken his own life, it is likely he would have lived long enough to watch his dream come to fruition.

World Daylight / Night Maps

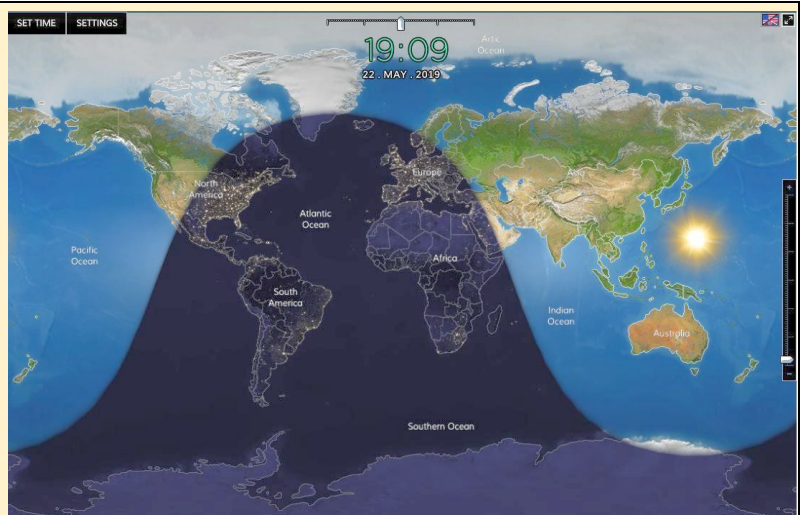
We have all seen the Geochron maps, a very cool item for your ham shack. However if you aren't up for spending \$400 there are some very nice web-based alternatives which are free.

The Live Space Station Tracking Map shows day/night map, and the location of the International Space Station. Click on the [] in the lower right corner to enlarge to full screen.

https://spotthestation.nasa.gov/tracking_map.cfm

The Solar System Scope Daylight Map (pictured) is more colorful, and you can change the time and view as needed. You'll need to activate Flash to view. Click on the box in the upper right corner to enlarge to full screen. <http://www.solarsystemscope.com/daylightmap/>

If you have dual screen monitors on your computer you can set the map to one screen and do your computing on the other. Or if you have Chromecast, you can cast it to your TV. Now isn't that cool.



Club Officers:

President.....Jim Matthews, K6EST
Vice-President.....Kent Hastings, WA6ZFY
Secretary.....Stephan Lonis, KM6RSO
Treasurer.....Kathy Favor, K6FAV
Director.....Rick Hubbard, KI6VOS
Director.....Arnott Smith, KF2TM
Director.....Dale Anderson, KK6EVX
Past President.....Tom Rider, W6JS

DO YOU HAVE OLD QST MAGAZINES IN SEARCH OF A NEW HOME?

Gene Wright has that future home for your QST's, through his project to place QST Magazines in professional offices throughout Chico. Labels placed on the QST's will advertise the Golden Empire Amateur Radio Society, encourage the readers to consider Ham Radio as an interesting hobby, one of not only fun, but which provides opportunities for many and various community services.

Bring your QST's to Gene at the Club meetings or contact: Gene WA6ZRT 530-519-2519



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"Mr. Nelson...I'm afraid you will have to leave the air for a while during this procedure."



I was aiming to be a professional amateur ham operator until I found out there was no profit in it.